An Overview and Guidelines for Ecosystem Approaches to Fisheries Management (EAFM)

NOAA's Participation in Indonesia's Marine Resources Program

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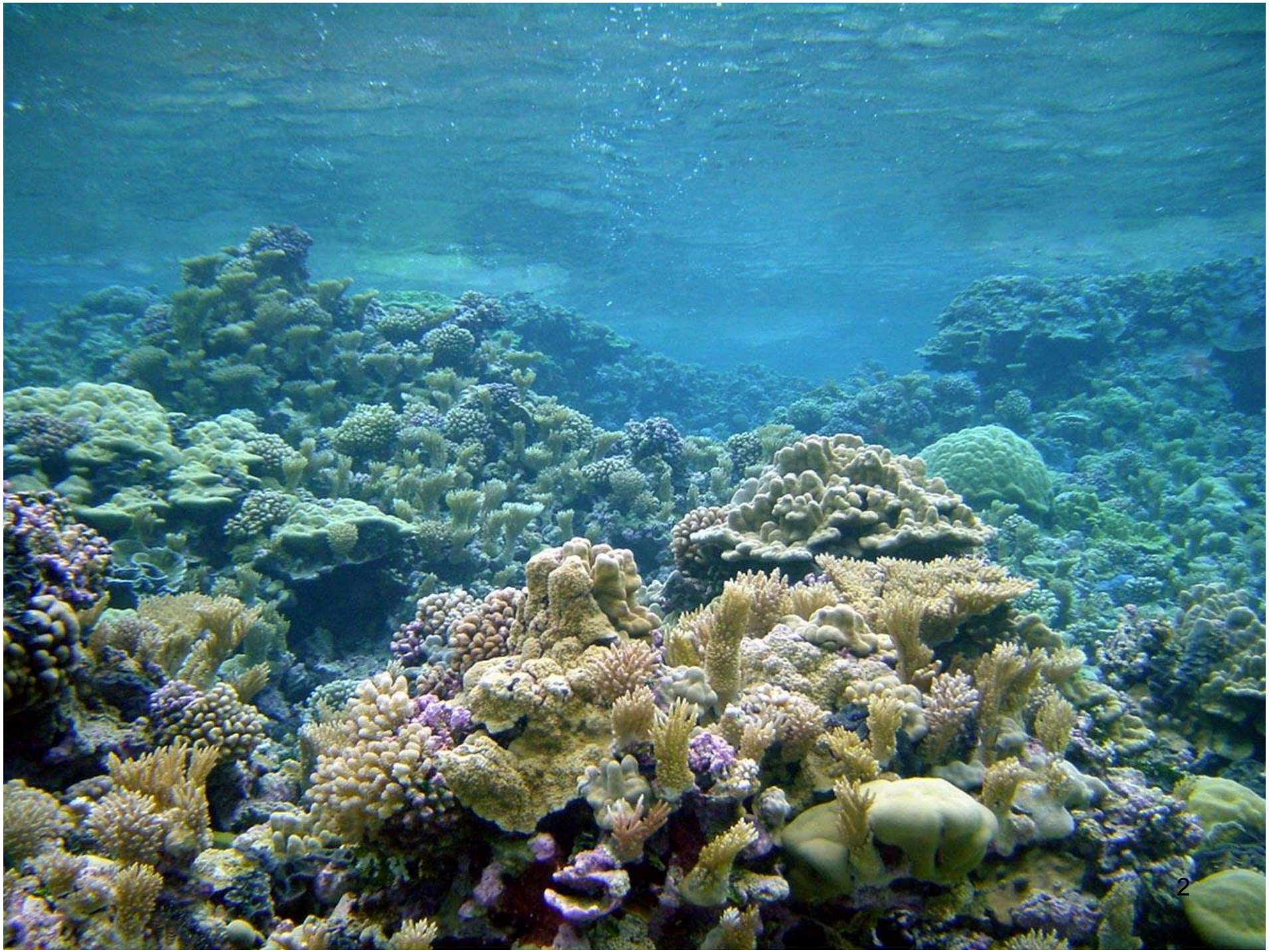
NOAA CORAL REEF CONSERVATION PROGRAM

USAID-IMACS Marine Resources Program Coordination Meeting, Jan. 25-26, 2012



BACKGROUND

In 2007, Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste came together to form the Coral Triangle Initiative (CTI) on coral reefs, fisheries and food security.

These CT6 countries adopted a Regional Plan of Action with 5 goals:

1) strengthen management of seascapes;

2) *apply ecosystem approach to fisheries management (EAFM)*;

3) develop & strengthen the management of marine protected areas;

4) implement climate change adaptation measures;

5) protect threatened marine species.

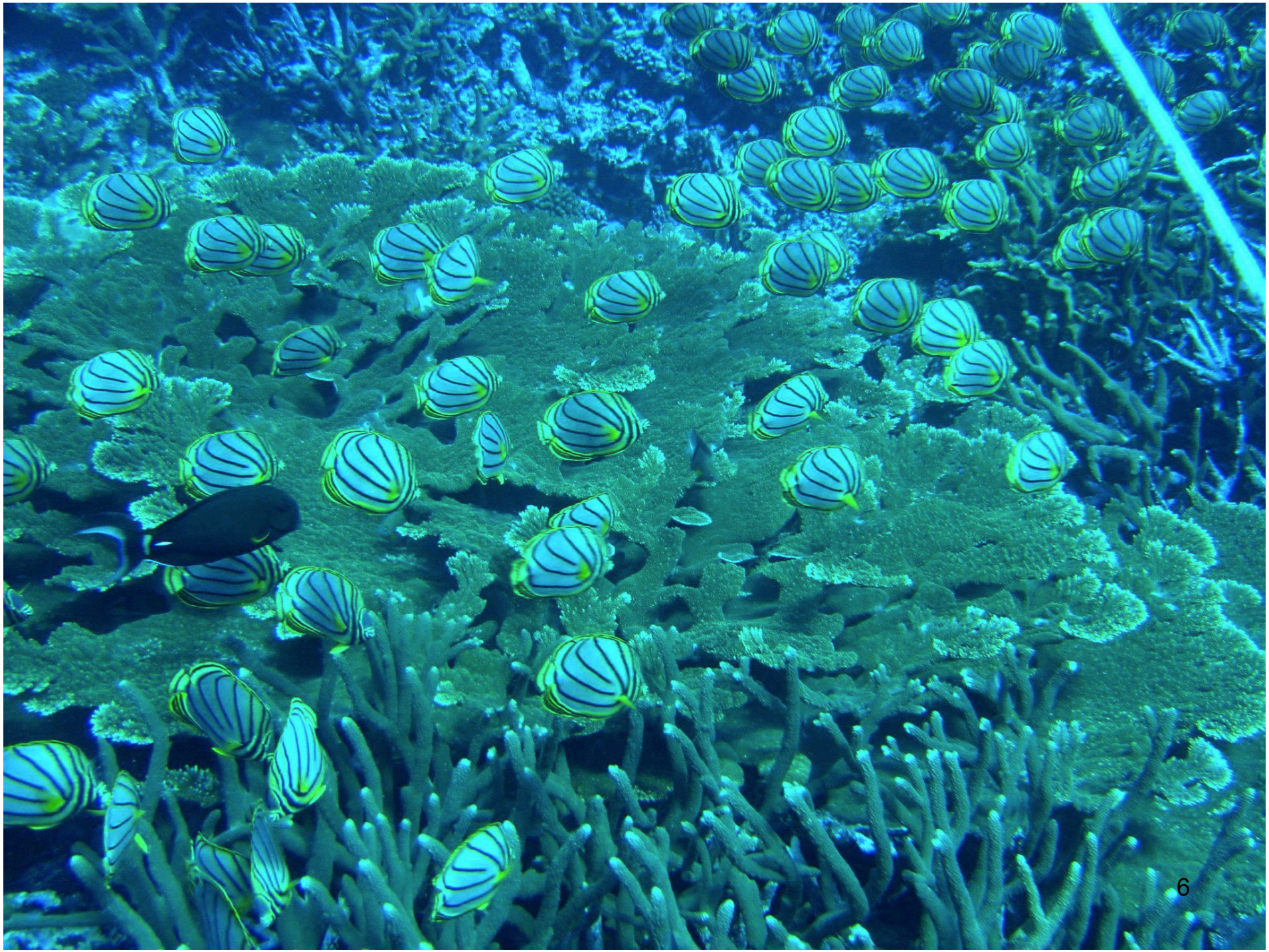
Target #1 of the EAFM goal is to have " strong legislative, policy, and regulatory frameworks in place for achieving EAFM", recognizing the need for collaboration and consistency across regional, national, and local governance scales.

GUIDELINES

EAFM background and guidelines presented here (mostly prepared by Bob Pomeroy) are meant to complement two previously developed guidelines on EAFM developed for the Asia and Pacific region.

The Secretariat of the Pacific Community (SPC) developed EAFM guidelines for Pacific Island countries (A community-based ecosystem approach to fisheries management: Guidelines for Pacific Island Countries. 2010. Noumea, New Caledonia).

The FAO Regional Office for Asia and the Pacific developed guidelines for the Asia-Pacific region (Staples, D and S. Funge-Smith. 2009. Ecosystem approach to fisheries and aquaculture: Implementing the FAO Code of Conduct for Responsible Fisheries. FAO Regional Office for Asia and the Pacific, Bangkok, RAP Publication 2009/11).



WHAT IS AN EAFM?

In 2003, FAO defined EAFM as “An approach to fisheries management that strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.”

An increased understanding of the interactions among different components of marine ecosystems, such as between species themselves and the interactions within the broader ecosystem, has led to a growing recognition of the need to manage fisheries in the context of their supporting ecosystems.

EAFM requires the inclusion of interactions between the core elements of the fishery - fish and fishers – but also the marine habitats (coral reefs, sea grass, mangroves) and environmental/oceanographic conditions that support these core elements and the governance structures relevant to management.

WHAT IS AN ECOSYSTEM?

An ecosystem can be defined as a relatively self-contained system that contains plants, animals (including humans), micro-organisms and non-living components of the environment, such as the geomorphology and varying oceanographic and environmental conditions, as well as the complex interactions between them.

Managing a fish stock in isolation from its ecosystem ignores the fact that fish species depend on ecosystems that are being affected by the fishing activity itself and by other natural processes and human activities.

HUMAN INFLUENCES

Fishing can affect other components of the ecosystem by: catching unwanted species, causing physical damage to habitats, disrupting food chains and causing changes in biodiversity.

Other human activities unrelated to fishing, such as agriculture, forestry and development also affect marine ecosystems, including the species that comprise them. The human impacts on ecosystems are increasingly being exacerbated by the effects of climate change and ocean acidification.

CHANGING THE WAY WE MANAGE FISHERIES

It is pointless to address the problem of depleted fish stocks merely by placing controls on fishing activities if the key threats to their recovery are related to other human activities and natural factors that are causing the degradation of ecosystems.

Globally, fisheries authorities are replacing target species–based fisheries management with broader approaches that attempt to manage fish stocks as components of marine ecosystems.

Under EAFM, sustainability extends from target fishery stocks to addressing the sustainability of the ecosystems upon which the fisheries depend.

EAFM addresses human and ecological well-being and merges the paradigm of protecting and conserving ecosystem structure and function with fisheries management that focuses on providing food security and livelihoods for humans.

CHANGING THE WAY WE MANAGE FISHERIES

As the objective of EAFM is the sustainable use of entire ecosystems as well as targeted species, non-fisheries activities that impact marine ecosystems must also be managed, even though these activities may be outside of the responsibilities and purview of fisheries authorities.

In addition to fishing, target stocks are affected by climate change and ocean acidification, coastal development, pollution and the loss of critical habitats by reclamation.

Effective implementation of EAFM requires collaboration and cooperation between communities and a diverse range of government agencies and communities responsible for managing activities that impact marine ecosystems.

CONVENTIONAL VS. EAFM

EAFM takes its focus in conventional fisheries management but broadens the perspective beyond seeing a fishery as simply "fish in the sea, people in boats", beyond consideration only of commercially important species, and beyond management efforts directed solely at the harvesting process

	Conventional Fisheries Management	EAFM
Management objectives	Fisheries sector	Multiple fisheries, ecosystem and socioeconomic
Species considered	Target species	All species in ecosystem, particularly those impacted by fishing
Scale	Stock/fishery	Broader ecosystem (spatial and temporal)
Assessment method	Stock assessment	Multispecies and ecosystem assessment/indicators
Data	Scientific	Scientific and traditional knowledge
Governance/management	Top-down; fishery specific	Participatory (e.g. co-management); adaptive management; cooperation and collaboration with communities and other government agencies
Management intervention	Mainly control of fishing	Broad-based incentives (including ecosystem tools such as MPAs); livelihoods

Source: FAO 2009

TRANSITIONING TO EAFM

While EAFM provides a broad approach to management, there is still much to be done to achieve full and effective implementation.

It should be remembered that EAFM is still an evolving practice and, at least in the near term, EAFM will be an extension of the current approach to fisheries management.

The transition toward EAFM is occurring now at varying rates around the globe.

EAFM does not replace or diminish the need for many aspects of conventional fisheries management, s uch as controling fishing mortality on target and by-catch species to sustain fisheries, nor the need to control fishing capacity in order to avoid economic waste.

EAMF VS. OTHER APPROACHES

EAFM provides a broader framework for management of marine resources to achieve sustainable use through improved ecological well-being and human well-being.

However, some think that EAFM will be more costly to implement and require more information and data and improved levels of decision-making, stakeholder participation and governance than conventional fisheries management. I'm less certain this is true!!!

EAMF VS. OTHER APPROACHES

EAFM complements and integrates other approaches to fisheries and marine and coastal resources management, including integrated coastal management (ICM), marine protected areas (MPAs), and ecosystem-based management (EBM).

Multi-sectoral approaches, such as EBM and ICM, deal with goals for management that include all sectors such as fisheries, mining, shipping, coastal development, and tourism.

Sectoral approaches, such as EAFM, focus on managing a given sector, such as fisheries, in a way that is consistent with a wider ecosystem (both natural and human) well-being focus. In line with the principles of EAFM, designated management areas such as MPAs address multiple objectives, covering both fisheries management and conservation objectives.

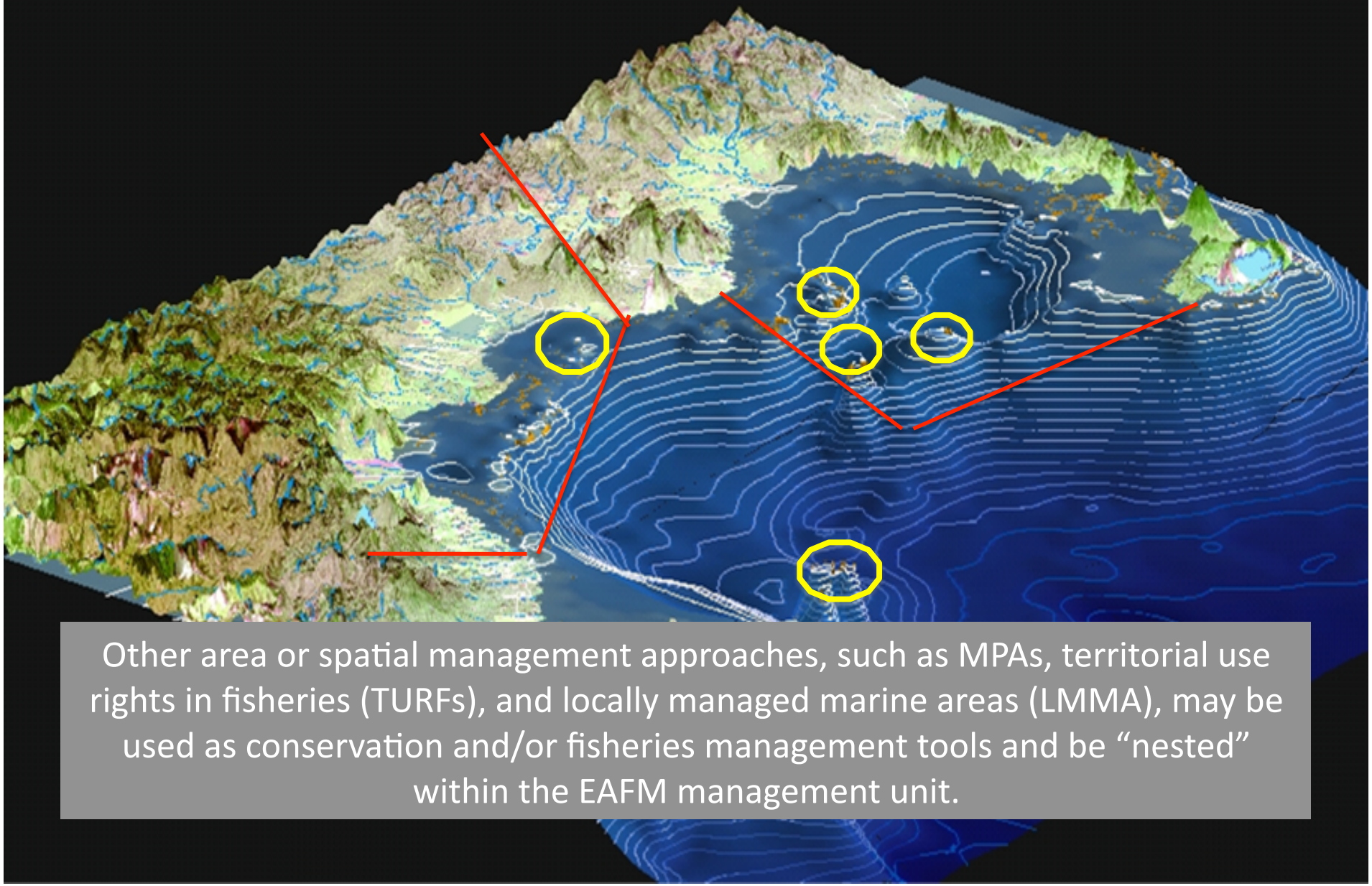
INTEGRATED APPROACHES - EBM

When EAFM, which focuses primarily on marine resources, is linked with ICM, which focuses primarily on terrestrial resources, it provides for broader marine and coastal ecosystem based management (EBM); integrating across sectors that impact, or are impacted by, the ecosystem.

With a wider range of marine and ocean governance approaches being utilized (e.g. marine spatial planning, large marine ecosystem, ICM) that deal with the management of several sectors, EAFM may be one approach "nested" within these broader approaches that combined support EBM.

All of these approaches recognize that management must deal with broad ecosystem management (including both natural and human components) and try to optimize the social and economic benefits (goods and services) of that activity.

EAMF AND MANAGED AREAS



Other area or spatial management approaches, such as MPAs, territorial use rights in fisheries (TURFs), and locally managed marine areas (LMMA), may be used as conservation and/or fisheries management tools and be “nested” within the EAFM management unit.

SCALE CONSIDERATIONS

Implement EAFM at the multiple spatial and temporal scales reflecting the natural organization of ecosystems. Consider interactions between: land and sea, people and the environment; and among stakeholders, managers, and scientists.

Need flexible, responsive management structures that allow for integration of science, management, and stakeholder involvement across different scales.

Scale should address the priority issues for effective governance. There are linkages between decisions about boundaries (ecosystems versus jurisdictions) and about scale (balancing management process with ecosystem features).

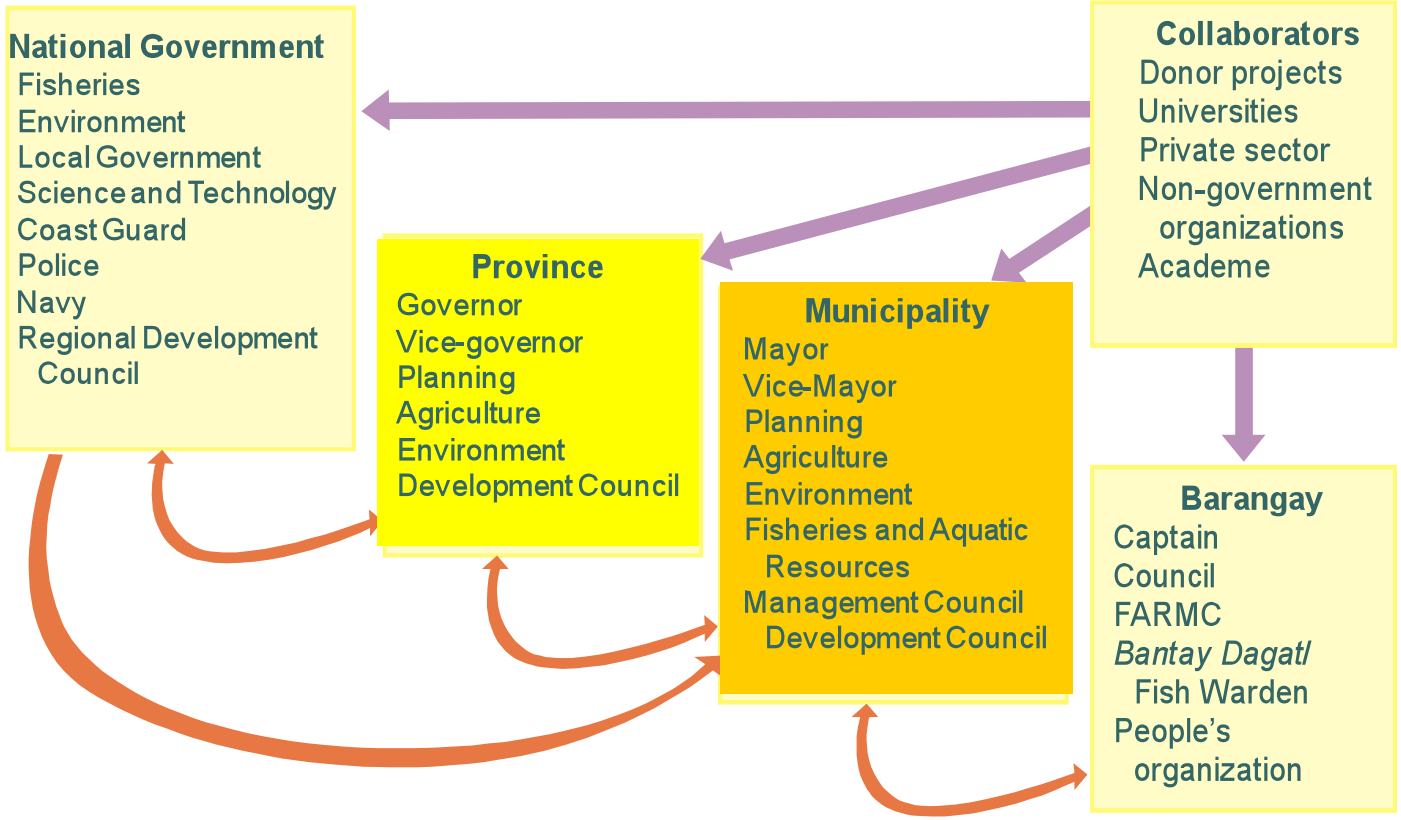
Need to scale-up or scale-down management decision making.

PARTICIPATION

Broadening stakeholder participation in the management process is a central principle of EAFM.

Co-management is an approach to implement EAFM with stakeholder participation. Cooperative management or co-management can be defined as a partnership arrangement in which the community of local resource users (fishers) and government share the responsibility and authority for the management.

INSTITUTIONAL COORDINATION



INSTITUTIONAL COORDINATION

Many issues threatening marine ecosystems are outside of the mandate of fisheries agencies and require engagement of wider expertise and actions of other agencies. They need to coordinate: in sharing data and information; supporting local implementation; harmonizing work plans and budgets).

Management decisions should be matched to the spatial scale of the ecosystem, to the programs for monitoring desired ecosystem attributes, and to the relevant management authorities (national to local).

EAFM should be integrated with other sectoral and environmental management approaches that address terrestrial and terrestrial/sea management.

PRIORITIZATION

Managers should develop, with relevant stakeholders, a set of objectives that are internally consistent and acceptable through compromise with diverse stakeholder groups. There will be difficulties in reconciling the competing objectives of multiple stakeholders utilizing resources from the same ecosystem.

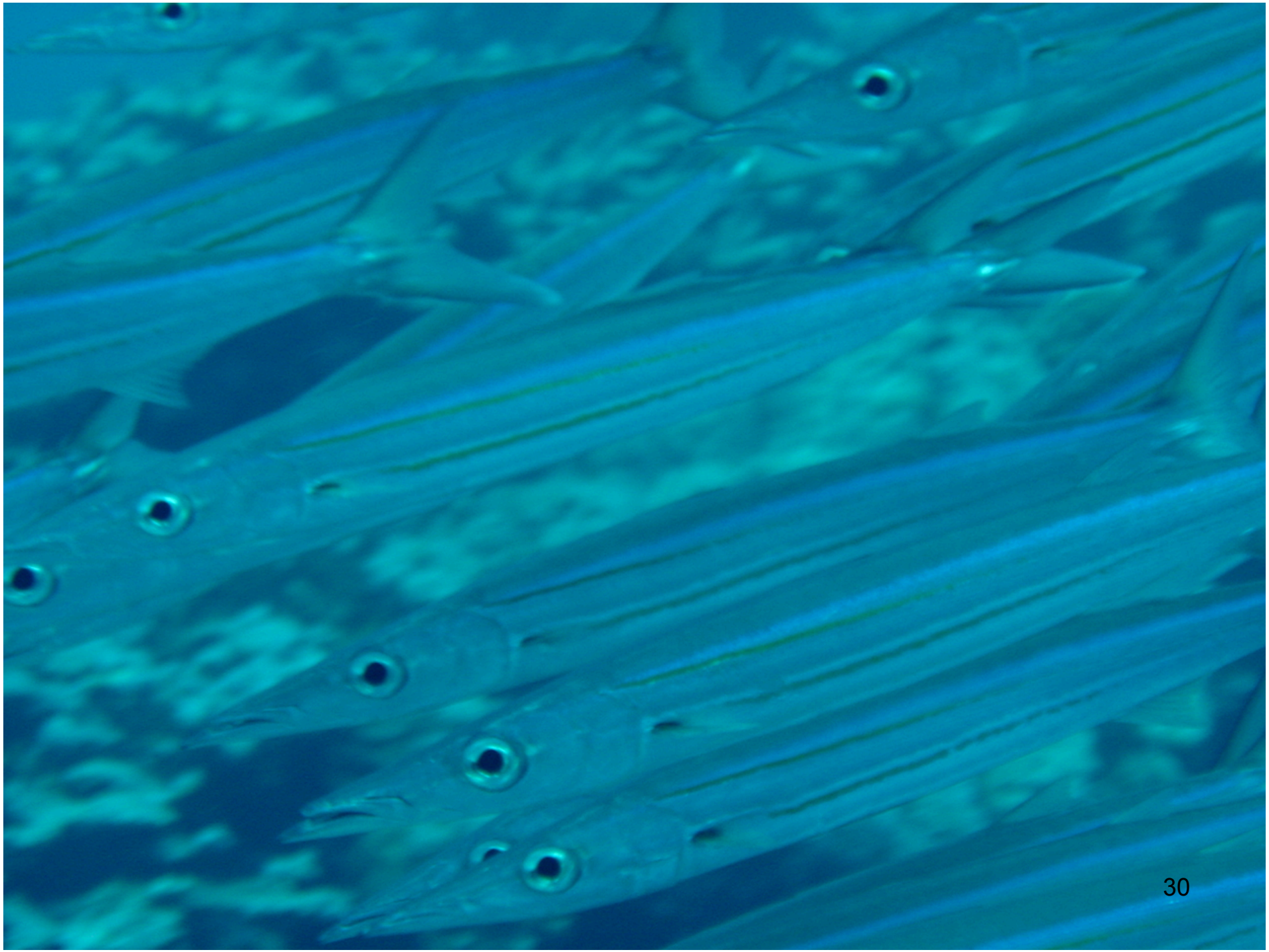
POLICY AND LEGISLATION

EAFM is not frequently an integral part of national fisheries policy and legislation which leads to management deficiencies:

(i) weak cross-sectoral consultation and cooperation and
(ii) the failure to consider, or a legal inability to act on, external influences such as pollution, habitat deterioration, or climate change.

For national policies and laws, EAFM may require that existing legal instruments and the practices of other sectors that interact with or impact on fisheries need to be re-considered and adjusted.

EAFM policy framework should include harmonized national and local legislation and policies.



KNOWLEDGE & INFORMATION

EAFM involves a broadening of conventional fisheries management practices and the associated knowledge and information. However, while new knowledge and information are needed, EAFM is based on the best available knowledge and information.

Knowledge and information should not be narrowly understood as simply written scientific material but should include the wealth of local and operational knowledge of fishers that may not be in written form but constitutes the knowledge basis for a fisher and the ways in which they operate.

COSTS

EAFM will likely incur higher management costs to cover the collection of more comprehensive ecosystem data and derived information products, additional planning and consultative decision-making, and a wider scope in monitoring, control and surveillance (MCS) and enforcement.

That said, many of the failures of conventional fisheries management for diverse tropical marine ecosystems have been related to insufficient stock assessments for most management unit species.

MANAGING FOR RESILIENCE

People in fishing communities are vulnerable to the compounding effects of stresses within fishery systems, as well as to ecological and social forces outside their domain of influence.

Building the adaptive capacity of ecosystems and of people is central to realizing the conservation, social and economic potential of fisheries (Andrew and Evans 2011). When integrated within the EAFM's overarching legal and policy environment, resilience approaches have the potential to profoundly improve fisheries management.

A resilient fishery may be defined as one that 'absorbs stress and reorganizes itself following disturbance, while still delivering ecosystem goods and services derived from the fishery'.

ADAPTIVE MANAGEMENT

Adaptive management differs from conventional fisheries management by emphasizing the importance of feedback from the fishery and the ecosystem in shaping management decisions, followed by experimentation to shape subsequent management decisions.

Adaptive management is the process of testing assumptions in order to learn and adapt future actions. The intention of using this test-learn-adapt, or 'learning by doing' approach is that results of testing and learning allow decision-makers and managers to adapt and make decisions regarding future management in a timely and informed manner.

PRECAUTIONARY APPROACH

The precautionary approach involves the application of prudent foresight to deal with uncertainties in fisheries systems. It implies consideration of possible undesirable outcomes and the inclusion of appropriate contingency and mitigation measures.

Undesirable outcomes include not only overexploitation of fishery resources and negative environmental impacts but also unacceptable social and economic outcomes, as well as long-term consideration of climate change and ocean acidification.

An important component of the precautionary approach is to establish legal and social frameworks including the control of access to fisheries.

LEGAL ASPECTS

Internationally, the principles of EAFM have been widely adopted as reflected in voluntary policies such as the UN Conference on Environment and Development, the Convention on Biological Diversity, the FAO Code of Conduct for Responsible Fisheries, and the 2002 Plan of Implementation of the World Summit on Sustainable Development. These instruments have been adopted by national parties in the CT6 countries, including Indonesia.

At national, provincial, and community levels, appropriate legal frameworks should be developed to support effective implementations of EAFM.

CAPACITY BUILDING

There may be inadequate capacity within management agencies and stakeholder groups to deal with the additional demands of EAFM and to understand the broad array of benefits (goods and services) provided by healthy marine ecosystems.

Capacity development requires understanding what EAFM and co-management is and how to organize and participate in it, communicating with other stakeholders, dealing with administrative and business matters, and participating in negotiations.

Capacity building is a continual process that empowers individuals and organizations to more effectively engage with management.

FINANCIAL RESOURCES

EAFM requires committed investment of financial resources to support various operations and facilities related to planning, implementation, coordination, monitoring (biophysical and socioeconomic) and enforcement, among others.

IMPLEMENTING EAFM

The application of an EAFM will vary depending on each country's circumstances, laws, policies, administration, resources, uses and socioeconomics.

While the implementation of EAFM is usually the responsibility of fishery agencies at different governance levels, EAFM requires coordination and cooperation with other agencies and community organizations responsible for managing other activities that impact marine ecosystems.

EAFM should include a coordinated process of data collection, planning, implementation, monitoring and review.

Integrated and adaptive management with broad stakeholder involvement are at the heart of the EAFM process.

EAFM PLANNING PROCESS

1. Fisheries agency start-up tasks
   - Define broad goals and strategies
   - Define scope/boundaries/fishery mgmt unit
   - Coordinate ministries/agencies/govt level
   - Establish core consultative group
   - Establish a legal basis for EAFM
   - Identify EAFM team/facilitators
   - Area integration (public awareness)
   - Identify stakeholders and organizations
   - Develop a broad workplan
2. Stakeholder engagement
   - Assess stakeholder interest/commitment
   - Awareness raising and empowerment
   - Community organizing
   - Community meetings
3. Research and Fisheries Management Unit (FMU) profile
4. Identify and prioritize issues through consultative process
5. Establish goals and objectives, indicators and benchmarks
6. EAFM management plan
   - Management actions to meet objectives
   - Finances
   - Evaluation/monitoring plan and Reports
   - Communication
7. Conflict management mechanism
8. Plan implementation (management measures, MCS, enforcement)
9. Legal and policy support
10. Monitoring performance
11. Evaluating and adapting the plan
12. Scaling up

From Bob Pomeroy (draft), FAO (2003, 2009) and SPC (2010)

FISHERIES MANAGEMENT UNIT

EAFM plans require clear statements of the area to be managed – the management unit. Though management units should ideally coincide with well-defined ecosystem boundaries, ecosystems are rarely so clearly well-defined entities and may cross or be contained within existing political or resource management boundaries.

Marine resources are usually managed by political jurisdictions rather than an ecosystem level. Try to use scales that address and balance political, social/ cultural, and ecosystem needs.

Management units should include the resources, fishers, and communities that have the strongest interconnections. There are no strict rules for achieving the balance between inclusion of ecosystem interactions and the simplicity that is essential for effective management.

Stakeholder perceptions and acceptance should be strong guiding factors (Berkes et al. 2001).


The Danajon Bank
P3DM Team

COORDINATION & COMMUNITY

Important to reach out and ensure that the coastal and fisheries institutions (e.g. fisheries, environment, marine protected areas, local government) at each level of government (national, regional, provincial, local) are informed and brought together to engage in the process. Desire inputs representing a wide range of community members, authorities, experts and agencies responsible for managing the activities that impact on the marine ecosystem.

Success of EAFM through community-based management or co-management is directly related to a well-organized community that has been empowered to take action to manage and conserve its marine resources.

Community organizing is much more than just establishing organizations, it is a process of empowerment, building awareness, promoting new values and behaviors, establishing self-reliance, building relationships, developing organizations and leadership, and enabling communities to take action.


HAWAII RESPONDER
SURVIVAL SUITS

SOCIAL PREPARATION

Activities aimed at increasing awareness, knowledge, skills and institutional capacity, are sometimes referred to as 'social preparation', which has several functions in EAFM:

- Reducing social conflict and resource impacts;
- Creating positive change in values/behavior towards the environment;
- Gaining support for EAFM;
- Increasing knowledge and skills of fishers and other stakeholders;
- Fostering participation in EAFM;
- Enabling community members to assert rights to manage resources.

Social preparation focuses on building a constituency for EAFM through a critical mass of people in the community who are environmentally literate, imbued with environmental ethics, shared responsibilities, and shared actions towards the sustainable management of marine resources.


CONFLICT MANAGEMENT

CONFLICT MANAGEMENT

Conflicts over fisheries and marine resources have many dimensions including, but not limited to, power, technology, political, gender, age and ethnicity. Conflicts can take place at a variety of levels, from within the household to the community, regional, societal and global scales.

A pluralistic approach that recognizes the multiple perspectives of stakeholders and the simultaneous effects of diverse causes in natural resource conflicts is needed to understand the initial situation and identify strategies for promoting change.

Conflict management is about helping people in conflict develop an effective process for dealing with their differences.

SCALING UP

EAFM often involves "scaling up" management, for example, from single-species fisheries management to management of multi-species assemblages; from looking at isolated drivers of change to considering all environmental and human impacts; from design of individual protected areas to planning protected area networks; from conservation of a fragment of habitat to comprehensive spatial management.

Issues of scale include what is the appropriate scale of the marine ecosystem for fisheries management purposes and ''scaling-up'' from other management arrangements such as community-based management to an ecosystem scale.

Geographically, the expansion could be from a small coastal community operating in a nearshore area up to the entire bay.

Functional expansion involves adding new program interventions, for example, if the current intervention relates largely to enforcement, functional expansion may involve adding new interventions such as livelihoods and education.

INCORPORATING CLIMATE CHANGE

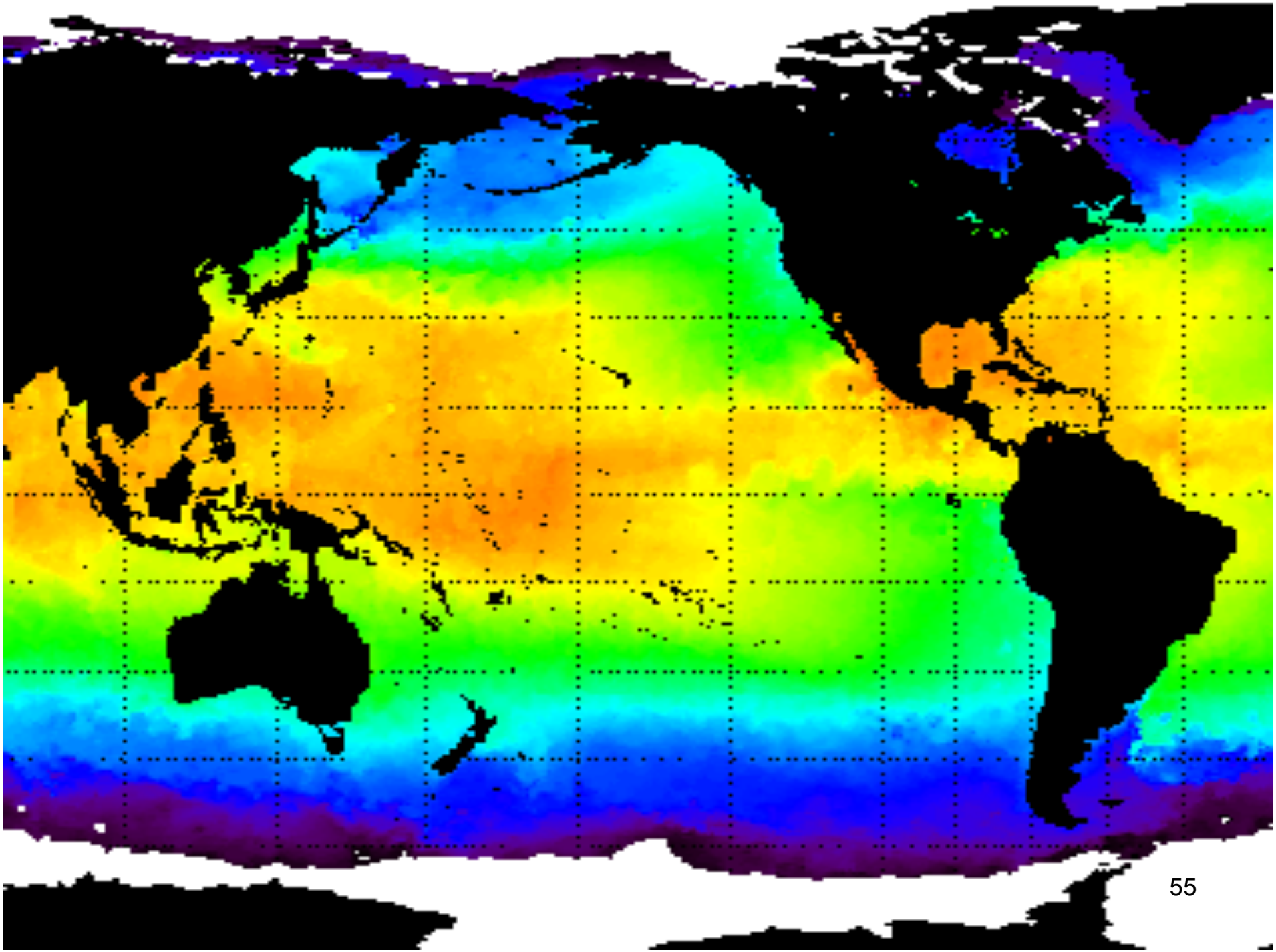
Climate change will affect fisheries and marine ecosystems through ocean warming, sea level rise, changes in precipitation, ocean circulation, frequency, intensity, and tracks of storms, and ocean acidification.

Though specific impacts on ecosystems and fisheries are uncertain, it is certain that there will be significant changes that will likely include species ranges and composition, productivity, ecological resilience, and increased stress to marine and coastal habitats.

Fisheries managers will have to explicitly consider such variations and move beyond management under the assumption of status quo conditions.

EAFM plans should include climate change vulnerability in the fisheries management unit over time and allow for additional management measures to be considered to address these impacts.

NOAA and CTSP are co-leading a Workshop to develop guidelines on incorporating considerations of climate change and ocean acidification into EAFM in the Coral Triangle.



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NOAA in Indonesia Marine Resources Program





NOAA partnerships in USAID/Indonesia's Marine Resources Program, in US CTI, NOAA CRCP and in Timor-Leste

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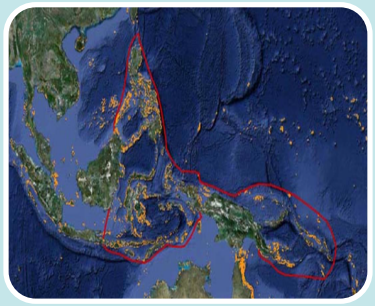
for more information on US CTI, visit the US CTI web-portal at: www.uscti.org

14 November 2011

NOAA Partnerships & Programs Contributing to NOAA/KKP Bilateral



U.S. Coral Triangle Initiative Support Program (US CTI)

- U.S.'s 5-year, $41M Support Program to the regional CTI and the CT6 countries
- NOAA as 1 of 3 implementing partners in US CTI
- NOAA provides govt to govt relations, technical assistance and capacity building in ecosystem-based management (EBM), MPA management and effectiveness, climate change adaptation, and ecosystem approaches to fisheries management (EAFM)

NOAA Partnership with USAID/Indonesia (Indonesia MRP)

- 5-year engagement, FY09-13, with USAID/Indonesia, KKP, IMACS, CTSP-I, DOJ
- MPA Capacity Building, institutionalization in Ministry of Marine Affairs and Fisheries: MPA 101, MPA Management Planning, EAFM for MPAs, Sustainable Tourism & MPAs
- Ecosystem Approaches to Fisheries Management (EAFM) capacity building: EAFM 101, Fisheries Management Planning, Ecosystem monitoring in data-poor environs, Port State Measures, On-board Observer Trainings

Partners in USAID/Indonesia's Indonesia Marine Resources Program (MRP)

Partner	Role in Indonesia MRP
USAID/Indonesia	Program management, financial support to implement Indonesia MRP
IMACS	Coordination support; technical assistance in EAFM and CCA
NOAA	Govt to govt relations, technical assistance and capacity building in MPA management, EAFM, and IUU
CTSP-Indonesia (MPAG)	Support to Govt of Indonesia on MPA strategy, learning networks, MPA policy, and trainings
US DOJ/ICITAP	Technical assistance, capacity building with Indonesian law enforcement organizations to address national and transnational environmental crimes in forest and marine ecosystems.
Govt of Indonesia, especially KKP	Partner with most of Indonesia MRP activities, including in MPA, EAFM, IUU

NOAA CORAL REEF CONSERVATION PROGRAM

NOAA Support to and Partnership with KKP through Indonesia MRP

- **Building capacity in the govt of Indonesia (primarily KKP) in:**
- **Marine Protected Area (MPA) Management** training of trainers (ToT) and curricula certification *(NOAA experts led by: Anne Walton, NOAA Office of National Marine Sanctuaries, Jason Philibotte (2010-11), Gabrielle Johnson (2011-12))*
- **Ecosystem Approaches to Fisheries Management (EAFM)** learning exchanges and ToT *(NOAA experts led by: Rusty Brainard , NOAA NMFS Coral Reef Ecosystem Division with team from NMFS/PIRO, NMFS PIFSC, NOAA IA)*
- **Port State Measures and combating IUU fishing** *(NOAA experts led by: Todd Dubois, NOAA NMFS Office of Law Enforcement with NOAA GCIL, IMCS Network, USCG)*

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Marine Protected Area (MPA) Management Capacity Building in Indonesia MRP

- Activities in partnership with NOAA, KKP, CTSP-Indonesia (MPAG)
- Training of Trainers in MPA management:
  - MPA 101 Training of Trainers (ToT): Completed along with needs assessment from 2010-2011
  - MPA Management Planning ToT: Final 2 of 4 trainings by early 2012
  - EAFM for MPA Managers ToT: 4 ToT from January - May 2012
  - Facilitation for MPA Managers: 2-3 trainings with practicum by May 2012
- Future engagement: Currently discussing with USAID/Indonesia about continuing this partnership beyond May 2012

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Ecosystem Approaches to Fisheries Management (EAFM) Capacity Building in Indonesia MRP

- In partnership with: USAID/Indonesia, KKP, IMACS, USGC, IMCS Network, DOJ ICITAT, Govt of Australia, and others
- Past efforts:
  - Port State Measures learning exchange (December 2009)
  - Indonesia Monitoring, Control and Surveillance (MCS) Assessment
- 2012 Activities in EAFM and IUU Capacity Building in Indonesia:
  - Port State Measures (2 x 1-week trainings)
  - EAFM 101 (including fisheries management planning) (3 x 1 week trainings)
  - Fisheries Observer training (2 week peer-to-peer learning exchange)
  - Reef Fish Stock Assessment in data-poor conditions (1-week training)
- Future trainings in Indonesia
  - MPA Enforcement
  - Climate change and ocean acidification for EAFM Managers
  - Spatial frameworks for EAFM

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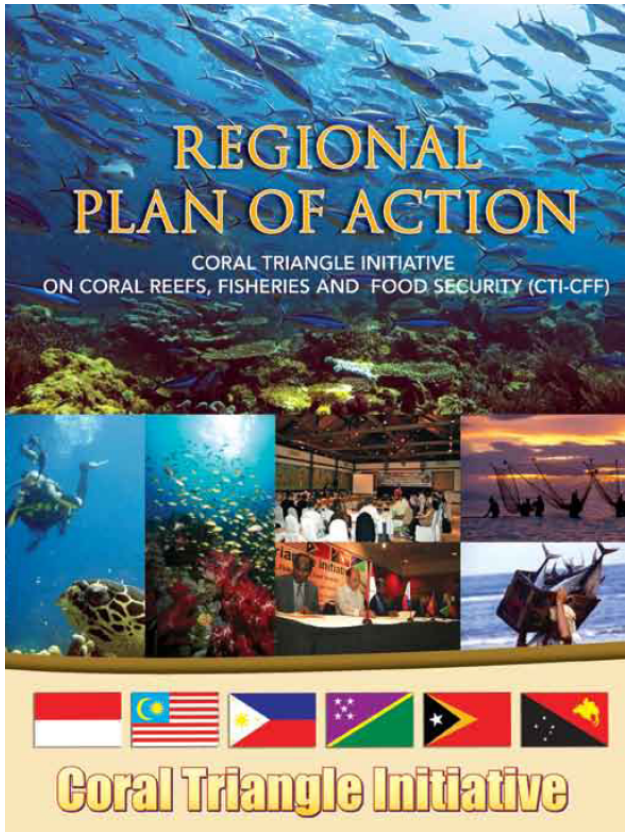
NOAA Role in US CTI

- Government to government relations & programs
- Integrated coastal & marine resource management:
  - Climate change adaptation
  - Marine protected area management
  - Fisheries management (EAFM)
  - Fisheries enforcement (IUU)
- Ecosystem-based management
  - Integrating all approaches at regional, national, sub-national scales
  - Geospatial tools



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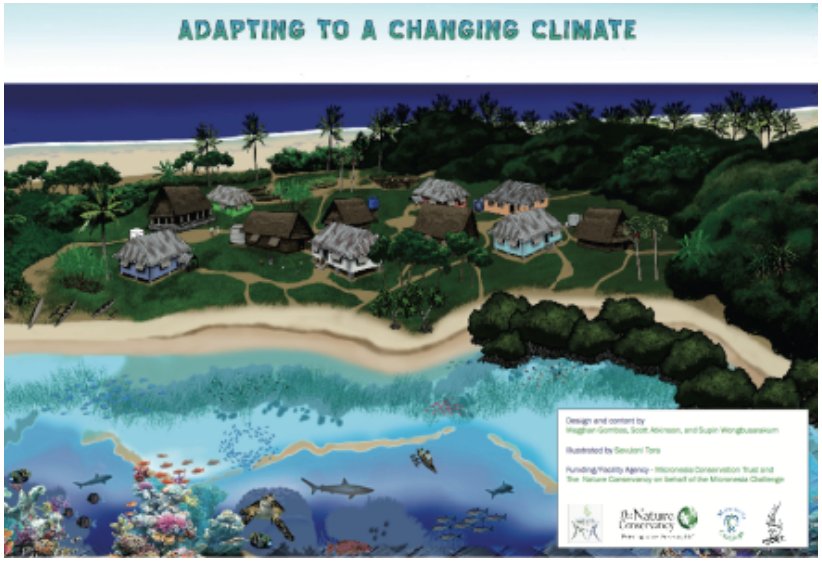
Climate Change Adaptation (CCA)

Endgame: Climate Change Adaptation "REAP" Adopted

- Regional policy & learning networks
  - CTI Region-wide Early Action Plan for Climate Change (REAP) (June '11)
  - Communiqué for COP-16
  - Regional climate information brief for the Coral Triangle
- Toolkit for local & national CCA planning
  - Local Climate Adaptation Stories (LEAP) developed and implemented in all CT6
  - Benchmarks for climate adaptation in coastal communities
  - Outreach toolkit: Adapting to a Changing Climate
  - CT Atlas climatologies



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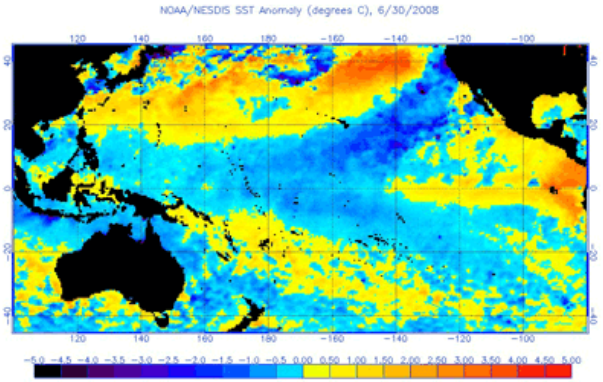
CCA Capacity Building: bilateral efforts



- In all CT6: Local Early Action Plans (**LEAP**) developed to validate and apply **REAP** recommendations
- In Philippines: Partnership with UP/MSI on **climate change vulnerability assessments** trainings, curricula, outreach
- In Philippines and in Timor-Leste: science partnership towards region's first **ocean acidification baseline**
- In Philippines, development of new capacity building trainings on CC/OA for fisheries managers: **"CC/OA for EAFM"**

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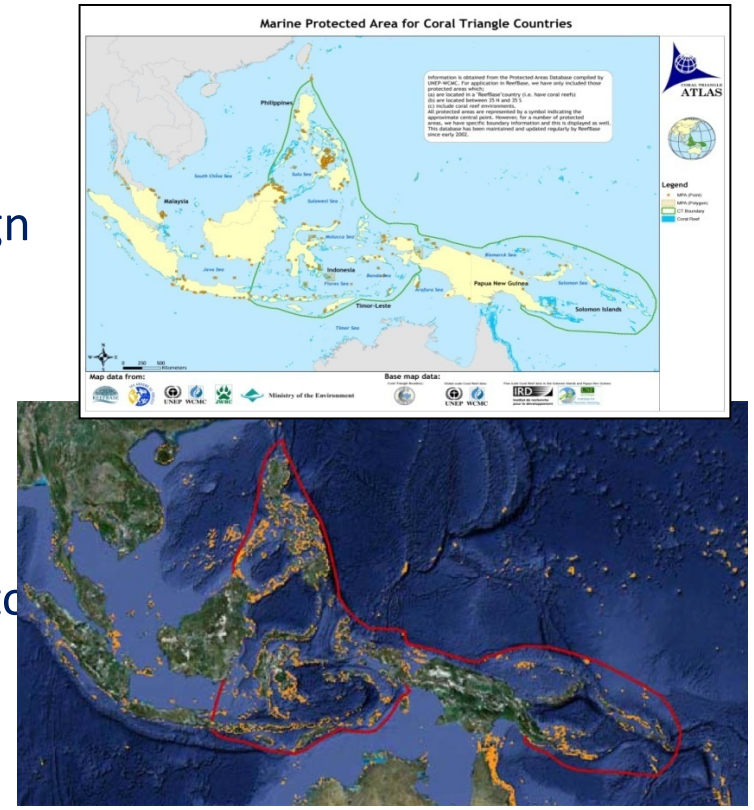
MPA Capacity Building

Endgame: CT MPA System Developed and Adopted

- Analysis of connectivity and climate impacts to inform MPA design
- Regional workshops for MPA TWG to design and adopt the CTMPAS
- MPA Effectiveness Protocol developed and adopted to inform resilient MPA design (CTSP)
- MPA integration sites finalized and linked to CTMPAS, and MPA Monitoring and Evaluation protocol implemented (CTSP)
- Regional exchange to inform design and build support for adoption of the CTMPAS (PI, CTSP, NOAA)



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MPA Capacity Building: bilateral efforts

- MPA Capacity Building program in Indonesia: leading to first **nationally-certified curricula** and **cadre of trainers** in MPA management
- NOAA program's focus on Indonesia's Ministry of Marine Affairs and Fisheries (MMAF)
- Trainings and curricula in:
  - **MPA 101**
  - **EAFM for MPAs**
  - **Facilitation for MPA Mgrs**
  - **MPA Management Planning**
- In Philippines, Verde Island Passage, NOAA partnered to implement the first **Climate SMART MPAs**
- NOAA CRCP efforts leading to **EBM management capacity building**

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Ecosystem Approaches to Fisheries Management

Endgame: EAFM Regional Policy Framework Adopted and National Guidelines Developed for Implementation

- **Regional policy** framework for CTI
- **Legal analyses** of CT6 fisheries laws
- Science for decision-making:
  "The E of EAFM"
- Climate change/ocean acidification guidelines for fisheries managers
  "CC/OA for EAFM"
- **MCS Assessments** of each country
- Comprehensive integrated toolkit on EAFM management, enforcement, and MPA and CCA

Photos: TNC

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EAFM Capacity Building: Bilateral Efforts

- In Indonesia: series of EAFM capacity building and peer-to-peer exchanges:
  - EAFM 101
  - Reef fish stock assessment in data-poor situations
  - Developing On-board Fisheries Observer Training Programs
  - Port State Measures (Fisheries Enforcement)
  - MPA Enforcement
- In Timor-Leste: EBM Tool development and capacity building:
  - Where are the resources? (Mapping habitat and bathymetry)
  - What are the resources? (Ecosystem & socioeconomic assessment)
  - Status of and threats to resources? (Monitoring Climate & Ocean Acidification impacts)
  - EBM Management Capacities (management decisions using tools)

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US CTI 'Legacy' in Ecosystem-based Management

- EBM Toolkit
- Place-based & applied across scales from local, national and 6-country regional
- Addresses ecosystem & human communities holistically
- Fully integrated approaches: CCA, MPA, EAFM
- Institutionalized within CTI & CT6
- Partnerships with U.S., Australia, NGOs, and ADB

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Thank you





National Oceanic and Atmospheric Administration, a partner in the Indonesia Marine Resources Program and in the US Coral Triangle Initiative Support Program

For information on NOAA's involvement in US CTI, please contact Janna Shackeroff, NOAA/CRCP, at Janna.Shackeroff@noaa.gov, and on US CTI, visit the US CTI web-portal at: www.uscti.org